Public Utilities Board

Please address any correspondence to Water Department

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President, Singapore Institute of Architects (SIA)
President, Institution of Engineers, Singapore (IES)
President, Association of Consulting Engineers, Singapore (ACES)
President, Real Estate Developers' Association of Singapore (REDAS)

PROVISION OF SEPARATE PIPING SYSTEM FOR NEWATER SUPPLY IN COMMERCIAL AND INDUSTRIAL DEVELOPMENTS

PUB intends to supply NEWater for air conditioning cooling towers in buildings and for suitable process water use in industrial premises. A separate NEWater pipeline network will be built that will eventually reach these buildings and industrial premises. All new commercial and industrial development proposals are required to provide a dedicated NEWater pipe system now to take in NEWater when the supply becomes available. For locations where the NEWater pipeline network will only be available after 2011, space provisions need to be made now for the new development proposals to facililtate NEWater pipe system installation in future. I attach herewith a technical information sheet on NEWater.

2 We would appreciate it if you could disseminate this circular to your members and inform your members to consult PUB on the above requirement during the pre-planning stage of the projects.

3 You may contact our Assistant Director (Customer Supply), Mr Chua Chor Pheng at Tel No: 67313883 or our Senior Manager (Customer Projects), Mr Kuang Kim Yaw at Tel No. 67313515 if you require any clarification.

Yours faithfully

CHONG HOU CHUN
DEPUTY DIRECTOR (TRANSMISSION & DISTRIBUTION)
for DIRECTOR
WATER DEPARTMENT

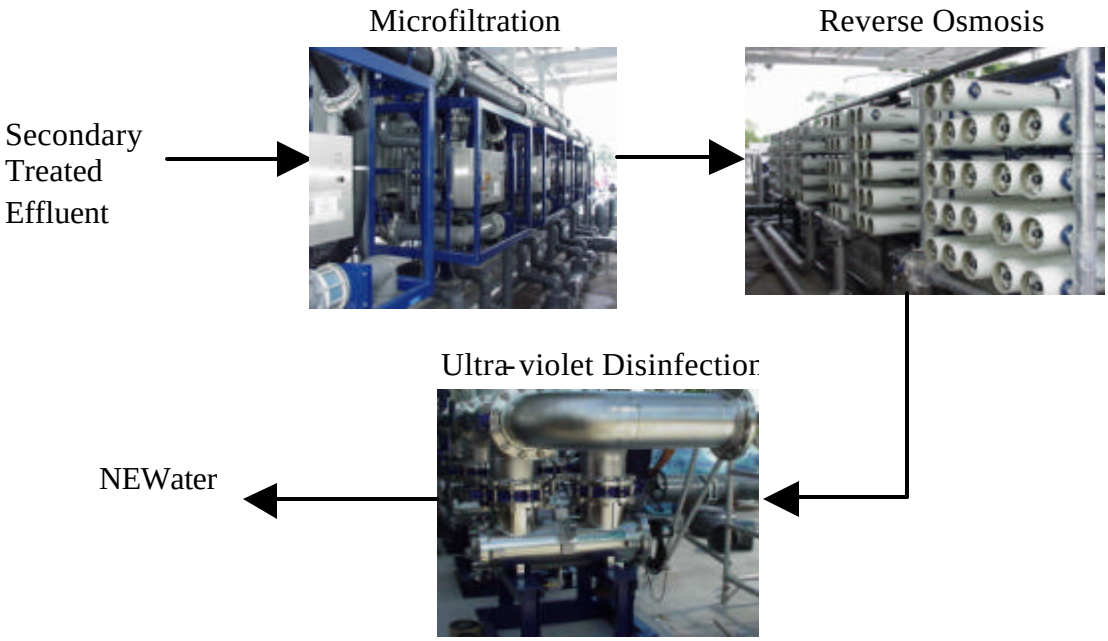
TECHNICAL INFORMATION ON NEWATER

1 INTRODUCTION

NEWater is high grade water reclaimed from used water (including water from household washing, cleaning, bathing and sewerage). NEWater is produced by passing treated used water through various proven and reliable treatment processes like microfiltration, reverse osmosis and ultra-violet disinfection.

2 TREATMENT PROCESSES

Microfiltration (MF) and reverse osmosis (RO) are the two membrane processes used in producing NEWater.



- **Microfiltration (MF)**

The MF units provide pretreatment of the secondary effluent before it is further treated or desalted by the RO membrane. They remove all suspended

solids, bacteria, protozoa and colloidal particles and ensure a consistently good quality feed water to the RO membrane units.

- **Reverse Osmosis (RO)**

The main function of the RO units is to desalt the water after MF units. The RO units remove all viruses, fine colloidal particles, dissolved organics and most of the dissolved salts

- **Ultra -violet (UV) disinfection**

The UV disinfection units after the RO units provide an added safety barrier against virus, bacteria and protozoa

3 NEWater QUALITY

NEWater quality is well within the current United States Environmental Protection Agency (USEPA) Drinking Water Standards and World Health Organisation (WHO) Drinking Water Guidelines. It is purer than PUB tap water.

Quality of NEWater (Typical Values)

PARAMETERS (IN MG/L UNLESS OTHERWISE STATED)		VALUE
1	Aluminium (as Al)	<0.10
2	Ammonical Nitrogen (as N)	<0.5
3	Barium (as Ba)	<0.05
4	Boron (as B)	<0.5
5	Calcium (as Ca)	<10
6	Chloride (as Cl)	<20
7	Conductivity (µS/cm)	<150
8	Copper (as Cu)	<0.05
9	Fluoride (as F)	<0.5
10	Heterotrophic Plate Count (CFU/ml, 35°C, 48 h)	<300
11	Iron (as Fe)	<0.05
12	Manganese (as Mn)	<0.05
13	Nitrate (as NO_3)	<15
14	pH	7 – 8.5
15	Silica (as SiO_2)	<1
16	Sodium (as Na)	<20
17	Strontium (as Sr)	<0.1
18	Sulphate (as SO_4)	<5
19	Total Alkalinity (as $CaCO_3$)	<50
20	Total Dissolved Solids	<100
21	Total Hardness (as $CaCO_3$)	<20
22	Total Organic Carbon (as C)	<0.5
23	Total Residual Chlorine	<1
24	Total Trihalomethanes	<0.08
25	Turbidity (NTU)	<0.5
26	Zinc (as Zn)	<0.1
27	All other constituents and parameters	Meet 1993 WHO Guideline Values and 1998 Addendum